

"Rim for a bicycle wheel with tubeless tyre"

The present invention relates to rims for bicycle wheels with tubeless tyres.

5 In particular, the invention regards a rim for a bicycle wheel with tubeless tyre, of the type comprising:

- a radially inner peripheral wall;
- a radially outer peripheral wall;
- 10 - two circumferential side walls which connect together said outer wall and said inner wall, in which said side walls extend radially outwards beyond said outer peripheral wall, forming two anchoring ribs for a tubeless tyre; and
- 15 - a valve body rigidly connected to said inner and outer walls for blowing inflation air into the chamber defined between the tyre and said outer peripheral wall of the rim.

A rim of the type specified above is, for example, 20 illustrated in Figure 2 of the European patent application EP-A-0 790 141. In this known solution, the valve body is directly connected to the inner and outer peripheral walls of the rim.

The purpose of the present invention is to provide 25 a rim of the type specified above which presents a relatively simple and inexpensive structure, enables easy and fast operations of assembly of the tyre, guarantees perfect tightness of the chamber defined between the tyre and the outer peripheral wall of the rim, and, finally, is able to use, as valve body, a 30 valve body of the standard type normally used for bicycle wheels with tyres provided with inner tubes.

With a view to achieving the above purposes, the subject of the present invention is a rim of the type 35 specified at the beginning of the present description,

further characterized in that said valve body is a valve body of a standard type used for bicycle wheels with tyres provided with inner tubes, and in that said valve body is connected to said inner and outer walls
5 of the rim by means of an intermediate tubular element which is mounted inside two holes facing one another that are made in said inner and outer walls and which presents a portion protruding radially beyond said inner wall in the direction of the axis of the rim, the
10 valve body being secured to said portion.

Preferably, the valve body has an external surface with a threaded portion screwed inside an end threaded portion of the internal surface of the intermediate tubular element.

15 In one first embodiment, the intermediate tubular element has its radially external end bonded or welded to the outer peripheral wall of the rim. In greater detail, in said embodiment the intermediate tubular element is hermetically bonded or welded to the
20 circumferential edge of the hole in the outer peripheral wall of the rim, as well as to the circumferential edge of the hole in the inner peripheral wall. Furthermore, preferably the radially external end of the intermediate tubular element has a
25 front surface that is substantially flush to the external surface of the outer peripheral wall.

In a second embodiment, the intermediate tubular element is instead connected in a disconnectable way to the rim. In a first example of implementation of said
30 second embodiment, the intermediate tubular element has a radially external end portion mounted in a removable way in a bushing which has its ends fixed, preferably bonded or welded, inside the aforesaid holes facing one another of the outer peripheral wall and inner
35 peripheral wall of the rim. In addition, between the

intermediate tubular element and the aforesaid bushing there are set sealing means, for example consisting of one or more O-rings which are mounted inside peripheral grooves of the intermediate tubular element and are pressed into contact with the internal surface of the aforesaid bushing. In the aforesaid first example of implementation of the second embodiment, the intermediate tubular element is screwed inside the bushing and has an annular contrast surface that engages the radially internal end surface of the bushing.

In a second example of implementation of the second embodiment of the invention, the intermediate tubular element has a widened head that rests on the external surface of the outer peripheral wall of the rim and a threaded portion protruding beyond the inner peripheral wall, in the direction of the axis of the rim, on which a nut is screwed, so as to pull the aforesaid head against its resting surface.

In a second example of implementation of the second embodiment, the aforesaid bushing is not present, and the intermediate tubular element is engaged through the aforesaid holes facing one another of the inner and outer peripheral walls of the rim and has a widened end head that rests on the external surface of said outer peripheral wall and a threaded portion that protrudes beyond the inner peripheral wall, in the direction of the axis of the rim, and on which a nut is screwed so as to pull the aforesaid head against its resting surface. Preferably, between said head and said resting surface there are set sealing means, for example consisting of an adhesive, or else an O-ring mounted inside a front annular groove made in the external surface of the outer peripheral wall, along the edge of the respective hole.

Thanks to the above-mentioned characteristics, the invention affords numerous advantages. First of all, the valve body used in the rim according to the invention may be a valve body of a standard type used
5 for rims with tyres provided with inner tubes. In the second place, the structure of the rim is simple and inexpensive and enables simple and fast operations both of assembly of the tyre and of assembly of the valve body. Finally, in the case of the second embodiment, in
10 which the aforesaid intermediate tubular element is connected in a removable way to the rim, the invention also enables easy and fast conversion of the rim in such a way as to adapt it to a tyre provided with inner tube. In this case, in fact, it will be sufficient to
15 remove the intermediate tubular element and mount the inner tube with the corresponding valve body in the traditional way, inserting the valve body through the two holes facing one another that are made in the outer and inner peripheral walls of the rim, as well as
20 through the aforesaid bushing in the examples of embodiment where the latter is present.

Further characteristics and advantages of the present invention will emerge from the ensuing description, with reference to the attached drawings,
25 provided purely by way of non-limiting example, in which:

- Figure 1 is a cross-sectional view of the rim according to the invention, in a plane containing the axis of the rim and in the point where the inflating
30 valve is mounted, according to a first embodiment of the invention;

- Figure 2 illustrates a first example of the second embodiment of the invention;

- Figures 3 and 4 illustrate two further examples
35 of said second embodiment.

In the figures, corresponding parts are designated by the same reference numbers.

In Figure 1, the reference number 1 designates, as a whole, a rim for a bicycle wheel, comprising an inner peripheral wall 2, an outer peripheral wall 3, and two circumferential side walls 4, 5, which connect the two walls 2, 3 together and extend radially outwards beyond the wall 3 in such a way as to form two ribs 6, 7 for anchorage of a tubeless tyre (not illustrated). In the area where the valve for inflating the tyre is to be mounted, the two walls 2, 3 have two holes 8, 9 facing one another, which have a common axis in the radial direction with respect to the axis of the rim, to the edges of which there is fixed, by means of welds or other bonding means S, an intermediate tubular element 10. The tubular element 10 has an end front surface, radially facing outwards and designated by 10a. The surface 10a is shaped and set flush with the external surface 3a of the outer peripheral wall 3 of the rim. In addition, the intermediate tubular element 10 has a portion 10b, which projects beyond the inner peripheral wall 2 in the direction of the axis of the rim (not illustrated) and which terminates with an end portion 10c that has an internal thread 10d. The reference number 11 designates a valve body (illustrated only schematically) of the standard type normally used for bicycle wheels with tyres provided with inner tubes. The internal structure of the valve body 11 is not illustrated in so far as it is in itself known. The valve body 11 has an intermediate threaded portion 11a, which is screwed into the threaded portion 10d of the tubular element 10.

Figure 2 illustrates a second embodiment, in which the intermediate tubular element 10 is connected in a disconnectable way to the rim 1. In the case of the

example of Figure 2, the intermediate tubular element 10 has a radially external end portion 10e, which is threaded on the outside and which is screwed into the internal threaded surface of a bushing 12, the ends of which are bonded or welded by means of welds or other bonding means S within the edges of the holes 8, 9. The end portion 10e of the intermediate tubular element 10 is moreover provided with an O-ring 13 received in a circumferential groove of said portion 10e and pressed into contact with the internal surface of the bushing 12 to ensure tightness for preventing air from coming out of the tyre chamber, which is defined between the tyre itself (not shown) and the outer peripheral wall 3 of the rim. Furthermore, the intermediate tubular element 10 has a collar 10f with an annular contrast surface 10g, which is in contact with the radially internal end surface of the bushing 12.

The embodiment illustrated in Figure 2 has a slightly more complicated structure than that of the example of Figure 1, but affords the advantage that it enables easy and fast conversion of the rim into a rim that can be used with a tyre provided with an inner tube. In this case, in fact, it is sufficient to unscrew the intermediate tubular element 10 to remove it, after which the inner tube of the tyre can be mounted in a conventional way, inserting the valve body associated to it through the internal passage of the bushing 12.

Figure 3 illustrates a variant of Figure 2, in which the disconnectable connection of the intermediate tubular element 10 inside the bushing 12 is obtained in a different way. In this case, in fact, the intermediate tubular element 10 has, at its radially external end, a widened head 14, which rests on the external surface 3a of the outer peripheral wall 3. In

addition, the part 10b of the intermediate tubular element 10, which projects beyond the inner peripheral wall 2, is threaded to allow screwing of a nut 15, which has the function of securing the intermediate
5 element 10 to the rim, pulling the head 14 against the resting surface 3a. In the case of the example of Figure 3, moreover, the intermediate tubular element 10 is provided with two O-rings 13 received in respective circumferential grooves of the intermediate tubular
10 element 10. Also the solution of Figure 3 obviously enables easy adaptation of the rim to a tyre provided with inner tube.

The example of Figure 4 differs from that of Figure 3 mainly on account of the elimination of the bushing
15 12. In this case, tightness is ensured by a single O-ring 16 that is received in a front circumferential groove 17 made in the surface 3a along the edge of the hole 9. The latter solution is preferred in the case of a rim made of a composite material, for instance
20 reinforced with carbon fibre, or in the case of a rim made of light alloy, on account of the absence of welds or other bonding means. Instead of the O-ring 16, any other sealing means may also be used, for example in the form of an adhesive. In addition, the head 14 can
25 be shaped so as to adapt to the profile of the surface 3a in a harmonious way.

From the foregoing description it is evident that the rim according to the invention has a structure that is relatively simple and inexpensive, whilst at the
30 same time guaranteeing perfect air tightness inside the chamber of the tyre. It further enables operations of assembly and disassembly to be carried out in a simple and rapid way, and, finally, makes possible, in the case of the aforesaid second embodiment referred to in
35 the examples of Figures 2, 3 and 4, an easy and rapid

adaptation of the rim to a tyre having an inner tube.

Of course, without prejudice to the principle of the invention, the details of construction and the embodiments may vary widely with respect to what is
5 described and illustrated herein purely by way of example, without thereby departing from the scope of the present invention.